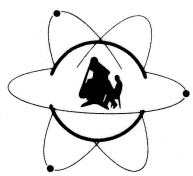
Mergenthaler

V-I-P

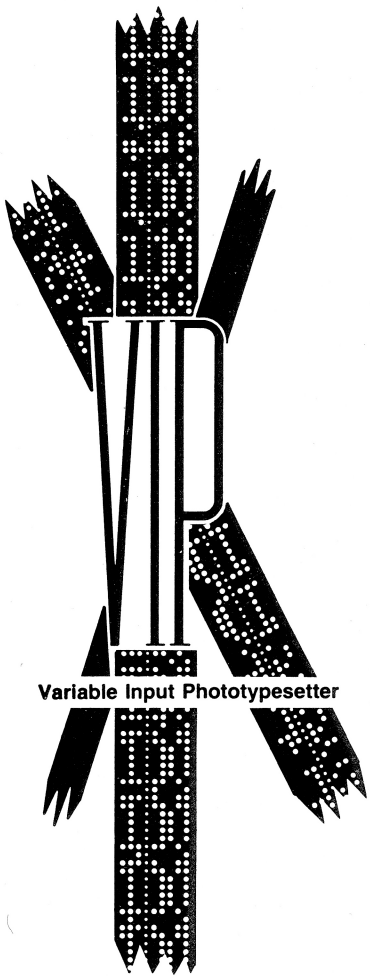
VARIABLE
INPUT
PHOTOTYPESETTER

Tape Preparation Manual

GENERAL SERVICE TRAINING DEPARTMENT



Tape Preparation Manual



Introduction

Tape Preparation

Coding

Wire Service

Mergenthaler Linotype Company P.O. Box 82, Plainview, N.Y., 11803

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V-I-P

Introduction

This manual contains coding information for the preparation of punched paper tape to be used as copy input to the Mergenthaler V-I-P (Variable Input Phototypesetter), designed and manufactured by the Mergenthaler Linotype Company, a division of Eltra Corporation. The instructions in this manual are applicable to the 8K V-I-P, Models 7245-1, 4845-1, 4836-1X and 4836-MX; the 12K V-I-P, Models 7245-2 and 3 and 4845-2 and 3, and the 12K base-aligning V-I-P, Models 7245-1A, 2A and 3A. A summary of machine instructions and characteristics for the eight Expanded V-I-P models available is provided at the end. The reader of this manual should be thoroughly familiar with the basic operation of the V-I-P.

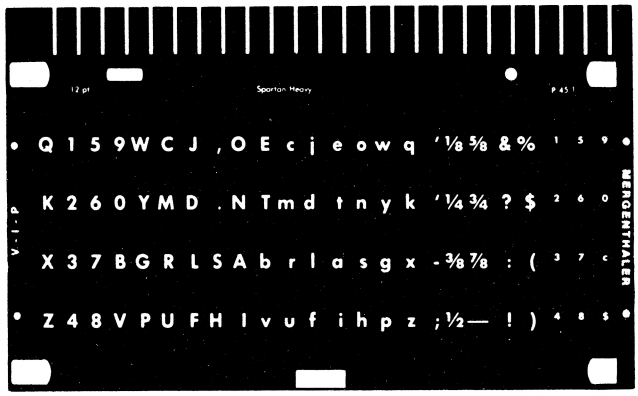
Tape Preparation

Paper tape used as copy input to the V-I-P must be punched in accordance with TTS (teletypesetter) 6-level codes. TTS tape incorporates an advanced feedhole, where the leading edge of the feedhole aligns with the leading edge of the code hole row. Use of input tapes with other than TTS coding and/or center-aligned feedholes can be accomplished through the use of special programs and machine setup procedures. Separate instructions are issued along with those programs.

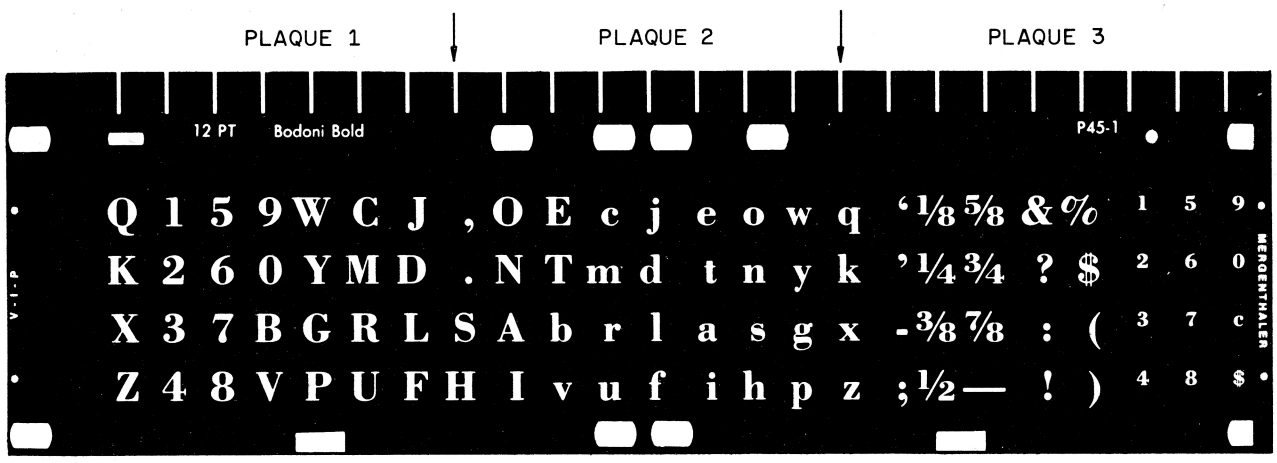
V-I-P Fonts

V-I-P typefaces on specially prepared filmstrips called FONTS are available in two size ranges. The A-range font shown in Figure 1 is used when output sizes between 6 and 24 points are desired. The B-range font (see Figure 1), in which the characters are twice the size of A-range, produces output sizes from 12 to 48 points (in the Display mode of operation both A- and B-range output sizes are doubled). Characters are located on the fonts in four 24-character rows. For reference purposes these rows are designated A through D from top to bottom, and positions within the rows are numbered 1 through 24 from left to right. The filmstrip is divided into three equal areas, or PLAQUES, encompassing positions A, B, C, D 1-8 (plaque 1), A, B, C, D 9-16 (plaque 2) and A, B, C, D 17-24 (plaque 3). The layout of alphanumeric characters in the first two plaques is the same on all fonts. Variations in layout of characters in plaque 3 are designed to make the fonts more suitable for particular typesetting applications, such as book text or food store ads. Each font is marked above the top character row with a typeface name, such as Helvetica Bold; a point size number, specifying the art work, in which that typeface was designed to be used; and a layout code (such as P45-1), describing generally which particular characters are at the locations on the font.

Pi fonts, or filmstrips containing an assortment of special characters not present on standard fonts, have been prepared in the A, B and A/B size ranges. The A and B Pi fonts are used in the same way as a normal typeface font and may be placed in any position on the drum. A slightly different situation exists for the combination A/B Pi font, however, and this variation is discussed in the section entitled "A/B Pi Font."



"A" RANGE FONT



"B" RANGE FONT

Figure 1 V-I-P Fonts

Character locations for five common font layouts are noted in Table 1. These layouts include:

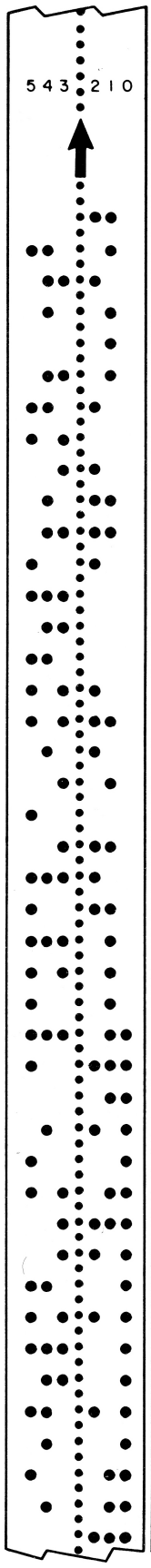
P45-1 Basic Newspaper Standard—Roman and Bold Roman typefaces
P45-2 Newspaper Standard—TTS Market Wire
P45-3 Newspaper Display Standard—B-range fonts
P34-1 Newspaper Standard—Italic typefaces
P34-2 Newspaper Standard—Bold Italic typefaces

Standard layouts have also been prepared for book, French-Canadian, European and South American markets and for job shops, to conform with the type requirements of those activities and keyboard characteristics encountered outside of the United States.

A/B Pi Font

A combination of 64 universal A- and B-range characters and symbols located on an A-range filmstrip comprise the A/B Pi font. This font is designed to satisfy the requirements found in various applications of phototypesetting for special characters not present in standard

Table 1 V-I-P Character Codes



V-I-P STANDARD FONTS

UNSHIFT							SHIFT							SUPERSHIFT						
FONT LOCATION	LAYOUT P45-1	P45-2	P45-3	P34-1	P34-2	CHARACTER	FONT LOCATION	LAYOUT P45-1	P45-2	P45-3	P34-1	P34-2	CHARACTER	FONT LOCATION	LAYOUT P45-1	P45-2	P45-3	P34-1	P34-2	CHARACTER
C13						a	C9						A							
C10						b	C4						B							
A11						c	A6						C							
B12						d	B7						D							
A13						e	A10						E							
D12						f	D7						F							
C15						g	C5						G							
D14						h	D8						H							
D13						i	D9						I							
A12						j	A7						J							
B16						k	B1						K							
C12						l	C7						L							
B11						m	B6						M							
B14						n	B9						N							
A14						o	A9						O							
D15						p	D5						P							
A16						q	A1						Q							
C11						r	C6						R							
C14						s	C8						S							
B13						t	B10						T							
D11						u	D6						U							
D10						v	D4						V							
A15						w	A5						W							
C16						x	C1						X							
B15						y	B5						Y							
D16						z	D1						Z							
A2						1	A18	1/8	1/8	/	+	¶		A22	1	1	1	Deg	[	
B2						2	B18	1/4	1/4	1/4	Minus	§		B22	2	2	2	Min	]	
C2						3	C18	3/8	3/8	1/3	1/3	1/3		C22	3	3	3	●	♦	
D2						4	D18	1/2	1/2	1/2	X	†		D22	4	4	4	•	◗	
A3						5	A19	5/8	5/8	2/3	2/3	2/3		A23	5	5	5	★	☆	
B3						6	B19	3/4	3/4	3/4	=	‡		B23	6	6	6	★	☆	
C3						7	C19	7/8	7/8	En Ld	En Ld	÷		C23	7	7	7	✓	#	
D3						8	D19	Em	Minus	Em	Em	Em		D23	8	8	8	■	▲	
A4						9	A20	&						A24	9	9	9	□	▼	
B4						0	B20	?						B24	0	0	0	©	@	
B8						PERIOD	B8	PERIOD												
A8						COMMA	A8	COMMA												
D17						;	C20	:						C24	¢	¢	¢	®	TM	
B17						’	A17	‘												
D21						)	C21	(						(A21)	%	+	%	/	/	
C17						HYPHEN	A21	%	+	%	/	/								
B21						$	D20	!						D24	$	$	$	·	℅	

V-I-P typefaces. A/B Pi fonts may be developed for a wide range of uses; Figure 2 depicts a Pi font designed for newspaper application. Layout of A- and B-range characters is standard on all A/B Pi fonts, however, the A-range characters are located on the A-range plaque and the B-range characters on the B-range plaque.

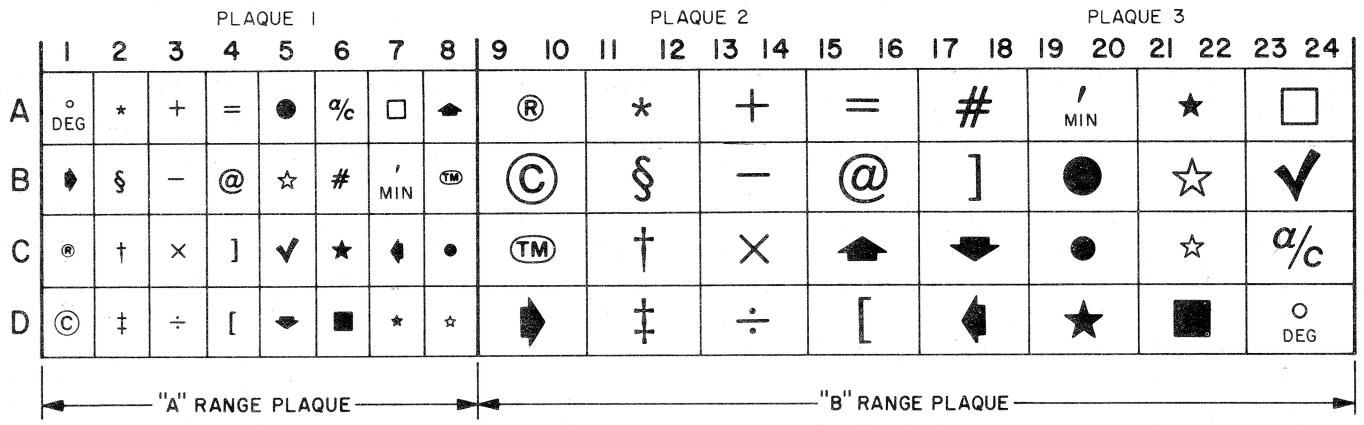


Figure 2 Standard Newspaper A/B Pi Font

Unlike a uniform A or B Pi font, the A/B Pi font must be mounted on the drum in font position number six, with the 16-point font change panel A/B Pi switch in the "up" position. Characters on the font are then accessed by effecting a change to font number six. If the last font used was in the "A" range, only A-range characters may be accessed on the A/B Pi font. Likewise, if the most recent font was in the "B" range, only the B Pi characters may be called. Any attempt to access an illegal character on the A/B Pi font will effect a Repeat status in the V-I-P. Figure 3 displays the layout of an A/B Pi keyboard, showing the keys which access the A and the B positions of the font.

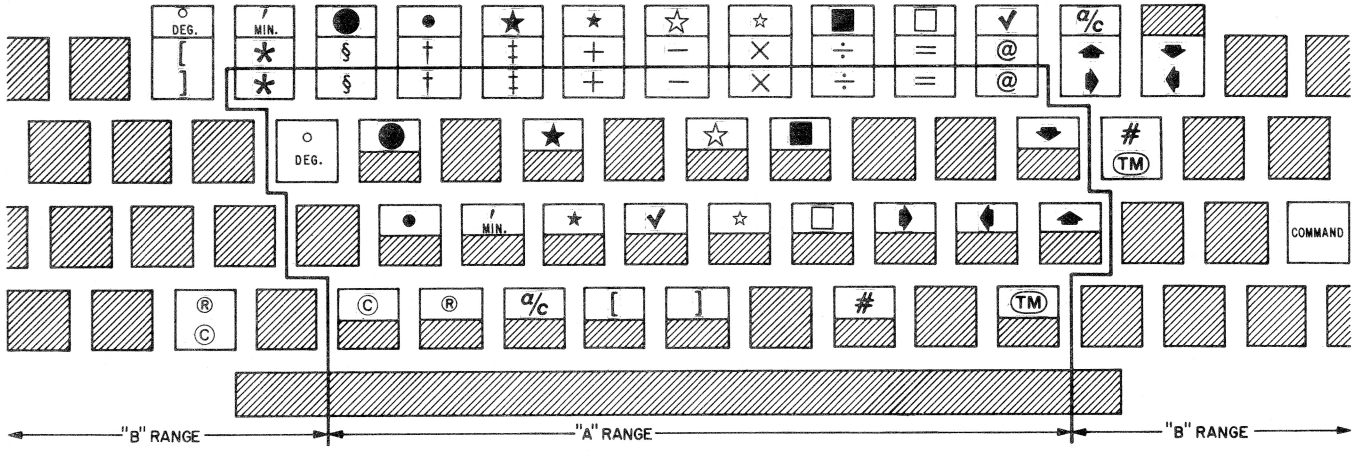


Figure 3 A/B Pi Keyboard

Basic Coding

Character Codes

Using TTS 6-level code a total of 64 unique code hole combinations are available. Forty-three of these are utilized by the V-I-P for font character selection (V-I-P's programmed for non-English languages require 47 codes for character selection), enabling the selection of 96 characters—the total character capacity of a font. The remaining 21 codes specify typesetting parameters (such as fixed and variable spaces, quadding and leadering) and machine control functions (including shifts, upper and lower rail, line deletions and endings). The 43 character codes which cause the exposure of a V-I-P font character onto output film or photographic paper are listed in Table 1. Code channels are identified by numbers 0-5 in the upper portion of the sample tape segment. Feedholes are located between channels 2 and 3, and the direction in which the tape is fed through the Reader is depicted by the arrow in the top left-hand corner of the table. The columns labeled UNSHIFT, SHIFT and SUPERSHIFT indicate the font location that will be flashed onto the film when a character code is read in either of those conditions. If, however, the unit is in the Supershift condition and a code is read that does not have a font location in the Supershift column, the character in font location D24 will be printed.

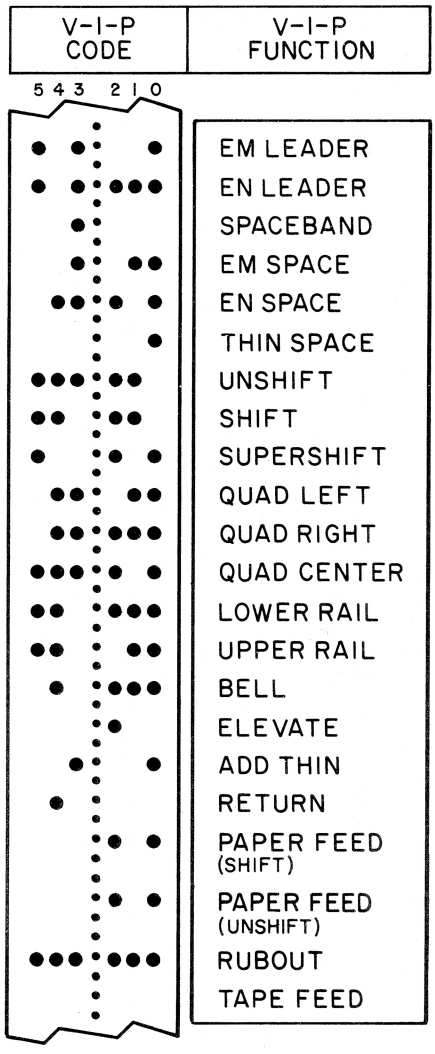
Command Codes

Table 2 depicts the 22 command codes used for machine control functions and for the definition of typesetting specifications to which the V-I-P will perform. Machine instructions, or combination command codes prefixed by the Bell code and which describe copy parameters or format, are discussed in the section entitled Machine Instructions, located in the Coding chapter of this manual. All command codes, with the exception of Bell codes, are recognized in the Unshift, Shift and Supershift conditions. Bell codes are recognized only in Unshift and Shift.

Width Codes

Character widths for each font are inputted on 8-level, center feedhole aligned

Table 2 Command Codes



punched paper tape. The code holes punched in the tape define character width in Relative Units, where one Relative Unit is equal to 1/18 of an em. The maximum encodable width per character is 18 Relative Units (one em) and the minimum, except for zero width, is 4 Relative Units. Character widths may be altered for special purposes by the preparation of modified width tapes; the final widths, however, must remain within the limits imposed by the established maximum and minimum.

Locations on the font for each character are shown adjoining the sample width tape strip in Figure 4. For reference purposes, Figure 4 shows the P45-1 font layout. The value of each hole is noted above the strip. The actual width assignment (real width) for each font position is three Relative Units more than the total number of holes punched for that location (reduced width). If the reduced width is zero, however, the real width will also be zero. The gauge in Figure 4 also indicates the position on the tape where reduced widths for fixed spaces and the en leader are encoded.

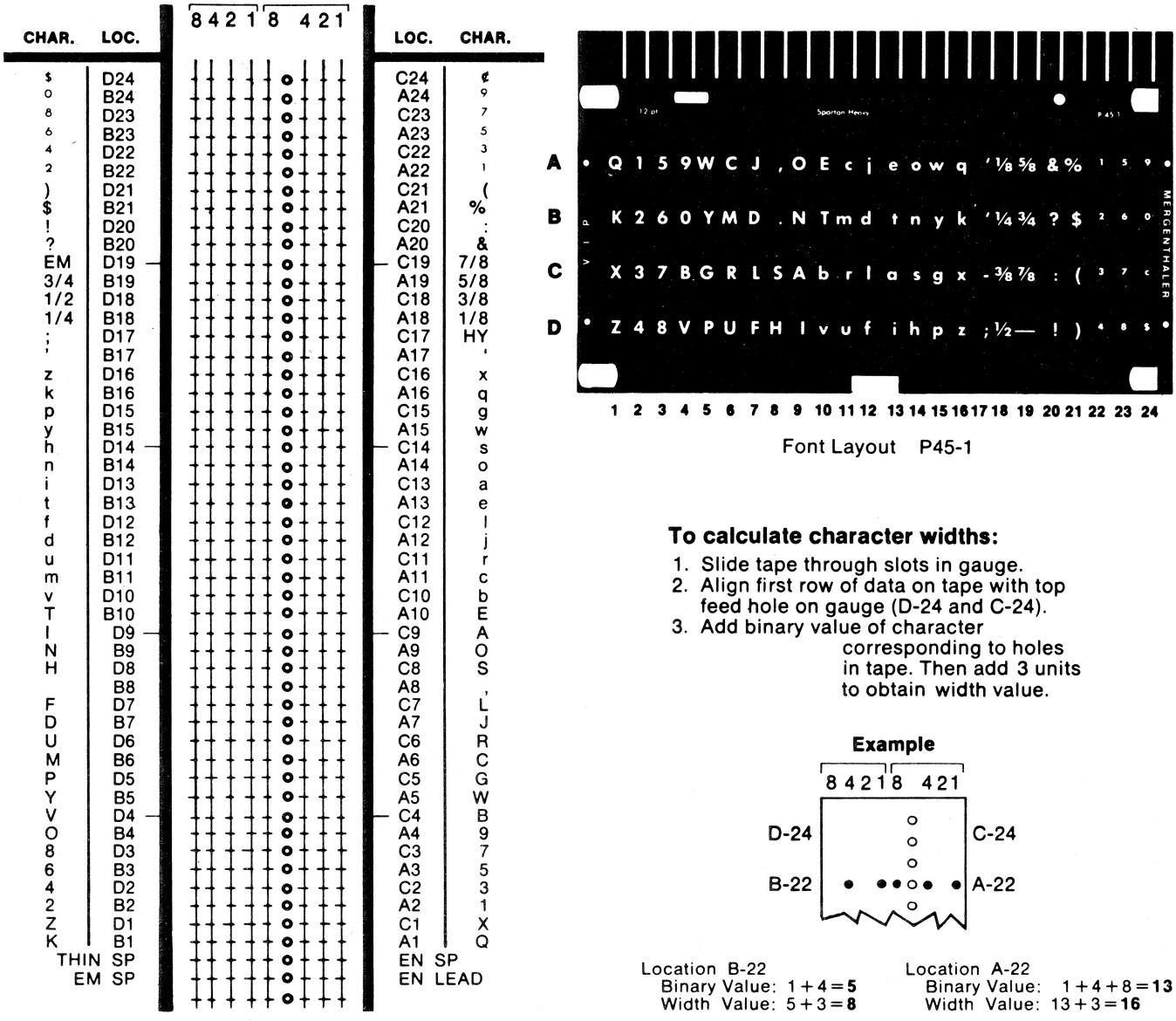


Figure 4 V-I-P Width Tape Gauge

Coding

Command Coding

This section provides a detailed account of the actions performed by the V-I-P in response to the reading of each command code when in the Justified, Unjustified and Display modes of operation. With a thorough understanding of V-I-P operation, tape may be prepared to accomplish typesetting functions with a minimum of keystrokes.

V-I-P characters are referenced to the baseline on A-range fonts and are center-aligned on the B-range fonts (see Figure 5). Also, with the exception of kerning characters they are all referenced to their right-side bearing. For these reasons the V-I-P will flash a character AFTER the mirror has advanced the character width (in the Display mode the film will advance prior to the flashing of a character). Similarly, when beginning to output a line of text the program will first advance the film and then output the line.

En Leader (Code 0, 1, 2, 3, 5)—This code will cause the V-I-P to advance one en width and flash a period, regardless of the width assignment for the period. The en width assignment of 9 Relative Units is entered from the font width tape; it is therefore possible to vary the en leader by redefining the en width, using a special width tape. Variation is also made possible by selection of a period from another font. Since the period is always in font location B8, this is accomplished by encoding a font change prior to the En Leader instruction.

Em Leader (Code 0, 3, 5)—The Em Leader code is equivalent to two En Leader codes; the V-I-P will advance one en space, flash a period, advance another en space and flash a second period. The appearance of the em leader may be varied by the use of a special width tape or by accessing different fonts as described for the en leader.

Spaceband (Code 3)—The value of a spaceband is determined by four spaceband parameter codes. These four codes define the minimum value that a spaceband may assume, the maximum value that a spaceband will increase to before hyphenation and letterspacing are attempted and the average spaceband value in quadded, ragged and auto-leadered lines. Spacebands may never lie at a value less than the encoded minimum. These four parameters may be altered via Bell coding to meet the requirements of the particular copy being set (see Spaceband Codes, page 11). Standard spaceband values, noted in parentheses, are assumed upon loading the program, patch or overlay tapes. Once a spaceband code has been altered, that value will remain in effect until changed by another Bell code, the program tape has been reloaded or a patch or overlay tape has been loaded. The four spaceband values are NOT reset upon initialization, or when a stop code is encountered. Changes are retained until new program instructions are entered or the V-I-P is reprogrammed.

Spacebands function differently in the Justified and Unjustified modes of operation.

1. Minimum Spaceband (3 Relative Units)—Each spaceband is set at this value upon input. A spaceband may never fall below this value.
2. Maximum Spaceband Before Hyphenation (9 Relative Units)—When a line has been overset, the spaceband value will increase up to this size before resorting to hyphenation. The encoded value for this spaceband limit must be equal to or greater than that for the minimum spaceband.
3. Maximum Spaceband Before Letterspacing (9 Relative Units)—In an overset condition after hyphenation has been attempted, the spaceband value will increase to this size before resorting to letterspacing. The value for the maximum spaceband before letterspacing must be equal to or greater than the maximum spaceband before hyphenation.
4. Average Spaceband (6 Relative Units)—In cases where a Quad code, ragged setting or auto-leadering is encountered, spacebands will be set at this value as long as an overset condition will not result. If an overset condition will result, spacebands will be set at the largest possible value below the encoded average spaceband value (a spaceband may never fall below the standard minimum of 3 Relative Units, however). The encoded value for this parameter must be equal to or greater than the minimum spaceband value.

In the Justified mode, a line is first read into the V-I-P with the encoded or standard minimum spaceband value. Upon reaching the end-of-line (Elevate) code (no check is made for oversets) the spacebands will be expanded, if necessary, up to the maximum value before letterspacing. If justification after this step is not possible, letterspacing will be initiated and spacebands will increase to the maximum value allowed for that operation (see Allow Letterspacing, page 15). Excess space, if any, will be divided equally between all spacebands. Letterspacing will therefore occur in the Justified mode, providing that BellK0 (Cancel Letterspacing) had not been encoded preceding the line of copy to be set.

In the Unjustified mode of operation the line is also read into the V-I-P using the minimum spaceband value. However, reading will stop when an overset condition occurs. Justification of the line will be attempted by gradually increasing the spaceband size to the maximum value before hyphenation; in doing this the V-I-P endeavors to push the overset word onto the next line. If the line cannot be justified in this manner, the word will be hyphenated (if allowed and if possible) and the spacebands will be expanded gradually to the maximum value before letterspacing. If the word or word part cannot be shifted via hyphenation and its associated spaceband increase, it will be transferred to the next line and the remaining line will be letterspaced. (Before the letterspacing operation will occur, the spaceband value must exceed the maximum value before letterspacing.) Excess space, if any, will be equally divided and added to each spaceband.

The only difference between the Justified and Unjustified modes recognized by the program involves the overset condition. When operating in the Justified mode the overset condition will be ignored, the line being read in until an Elevate code is reached. If a pre-justified line exceeds the line measure, that line on output will extend beyond the right margin with the minimum spaceband value. In the Unjustified mode of operation an overset condition will stop the reading-in of a line.

En Space (Code 0,2,3,4)—This code instructs the V-I-P to create a fixed space equal to the width of the figure characters (numerals) on the font in use. On most fonts the numeral width

lies between 8 and 12 Relative Units. These limits are permitted to be extended down to 7 or up to 14, however, for a very condensed or a very expanded font. The en space assignment is also entered from the font width tape, rendering it capable of variation.

Em Space (Code 0,1,3)—The Em Space code initiates the creation of an 18-Relative Unit fixed space, designated one "em." The em space width assignment is entered into the V-I-P memory from the font width tape and may therefore be varied independently.

Thin Space (Code 0)—Creation of a fixed space equal in width to the period character on the font in use is initiated by the Thin Space code. The period width is dependent upon the figure (or en space) width, as follows:

Figure and En Space Width	Period and Thin Space Width
7 Relative Units	4 Relative Units
8 Relative Units	4 Relative Units
9 Relative Units	6 Relative Units
10 Relative Units	5 Relative Units
11 Relative Units	6 Relative Units
12 Relative Units	6 Relative Units
13 Relative Units	6 Relative Units
14 Relative Units	7 Relative Units

Thin space width assignment, like that of en and em spaces, is entered into memory from the font width tape, rendering it capable of special independent variation.

Unshift (Code 1,2,3,4,5)—This code directs that all subsequent character codes will remain in the Unshift condition. The program will stay in the Unshift condition until a Shift or Supershift code is encountered.

Shift (Code 1,2,4,5)—When the Shift code is encountered, all subsequent character codes will be read in the Shift condition. This condition will remain until an Unshift or Supershift code is read.

Supershift (Code 0,2,5)—Supershift, also called VERTICAL RULE, defines that all subsequent character codes will be read in the Supershift state. The program will stay in this condition until a Shift or an Unshift code is read.

Quad Left[1] (Code 0,1,3,4)—Quad Left is an end-of-line code in both the Justified and Unjustified modes of operation. Insertion of the code causes the V-I-P to set characters starting from the left margin with all spacebands set at the average spaceband value, when doing so will not produce an overset condition. If the latter condition does occur, spacebands will be set at the largest possible value below the average, but never less than the minimum (3 Relative Units).

Quad Right[1] (Code 0,1,2,3,4)—This code is almost identical to Quad Left, above, the exception being that characters are now set to end flush with the right margin.

Quad Center[1] (Code 0,2,3,4,5)—Quad Center is also identical to Quad Left, except that here lines are equally spaced between the right and left margins.

[1] In the Justified mode, all codes following a Quad code will be ignored until an Elevate code is encountered.

Lower Rail[2] (Code 0,1,2,4,5), Upper Rail[2] (Code 0,1,4,5)—Application of these codes directs the V-I-P to access characters from the next lower or higher font, depending on which of the codes is applied. The Lower and Upper Rail codes are equivalent to a font change of one unit minus or one unit plus. Any number of these codes may be placed together to accomplish font changes. When using Upper Rail there is NO automatic return to Lower Rail upon reading an end-of-line code. First access must be to next higher font (Upper Rail).

Bell (Code 0,1,2,4)—This code prepares the V-I-P to receive machine instructions. It is the introductory code of the multiple-code combinations which control font changes, point size, line measure, film advance, program stops and other features of the Expanded V-I-P. All of the multiple-code machine instructions are discussed in the next section, entitled "Machine Instructions."

Elevate (Code 2)—This end-of-line code will force justification in both the Justified and Unjustified modes.

Add Thin (Code 0,3)—Add Thin is a delete code that works differently in the Justified and Unjustified modes. In the case of the former, Add Thin will delete all text, font changes and point size changes since the last end-of-line code. The code must be placed directly following the text to be deleted, and no space must exist between the Add Thin code and the new text.

Example 1

KILL1KILL2Bell P08KILL3A NEW LINE OF TEXT...on the input, where A is the Add Thin code, produces NEW LINE OF TEXT...on the output.

In the Unjustified mode of operation utilization of Add Thin will effect the deletion of all text, font changes and point size changes up to and including the last spaceband encountered. The Add Thin code must be placed after the word to be deleted, and a space MUST be added between the delete code and the rest of the text.

Example 2

WORD1 WORD2 Bell12KILLA WORD3...on the input tape will yield
WORD1 WORD2 WORD3...on the output.

Paper Feed (Unshift) (Code 0,2)—This code creates a fixed space of minus 1 Relative Unit—in effect a backspace of 1/18 em. The Paper Feed code may be used singularly or in multiples between two printing characters to effect kerning or tightening of character fit.

Paper Feed (Shift) (Code 0,2)—The Paper Feed code in the Shift condition creates a fixed space equal to plus 1 Relative Unit. The V-I-P is also available in a version where, by the use of a special program tape, this code will create a fixed space of 1 point.

Rubout (Code 0,1,2,3,4,5)—Rubout is essentially ignored by the program; however, the program will stop the Tape Reader after 100 consecutive Rubout codes and then insert a Stop code in the output buffer. The machine will continue to output after the Tape Reader has been turned off. For this reason the V-I-P must not be handled until the RUN light has been turned off, indicating that outputting has been completed.

[2]Encoding a change to Lower Rail when in font 1, and Upper Rail when in font 6 will cause erroneous widths to be accessed.

Tape Feed (feedholes only)—The V-I-P ignores this code.

Return (Code 4)—The Return code is utilized in conjunction with the format capability of the V-I-P. When encountered in a format, Return will cause the subsequent code position of the format to be stored and input from the Tape Reader will continue. When present on the input tape, the Return instruction will effect a return to the format at the code location where the subroutine had last been exited. The format capability, along with the preceding "merge" function, is fully defined in the section entitled "Formatting," page 18.

Machine Instructions (Bell Coding)

Combination command codes which are prefixed by the Bell code and which describe copy parameters or format are termed MACHINE INSTRUCTIONS. V-I-P response to an illegal instruction is noted, where helpful to the user, in the description of that Bell code. Table 3 is a summary of all machine instructions that have been programmed into the Expanded V-I-P.

Font Change (Bell1), (BellXBell1) or (BellX1)—Font changes within a single drum are effected by the code Bell1, where "1" stands for font position number 1, 2, 3, 4, 5 or 6. To change fonts between drums the code BellXBell1 or BellX1 is used, where "X" stands for A (for a change to drum A), B (for a change to drum B) or C (for a change to drum C), and "1" represents font position 1, 2, 3, 4, 5 or 6. One-drum programs are utilized with an 8K memory, while two-drum and three-drum programs are used with a 12K memory V-I-P.

Point Size (BellP12)—The BellP code followed by two numerals will initiate a point size change, causing subsequent characters to be set at the encoded point size. Point sizes permissible for A-range fonts (see Table 4 for point sizes available per model) include 6, 7, 8, 9, 10, 11, 12, 14, 18, 20 and 24 (in 72 pt. machines, sizes 27, 30 and 36 are in addition to these). Legal B-range point sizes include 12, 14, 16, 18, 20, 22, 24, 28, 36, 40 and 48 (72 pt. machines add sizes 54, 60 and 72). When coding for sizes 6, 7, 8 or 9, the first numeral following the character P must be a zero. All point sizes entered must agree with the permissible sizes for the range of the font in use at the time the command is entered (if an illegal point size is encoded, the V-I-P will assume 6 points for an A-range and 12 points for a B-range font).

Spaceband Codes

1. Set Minimum Spaceband (BellTN1)—the minimum spaceband is set to assume the encoded value. This value may fall between 1 and 9 Relative Units, inclusive.
2. Set Maximum Spaceband Before Hyphenation (BellTM12)—this encoded spaceband value may lie between 01 and 99 Relative Units, inclusive.
3. Set Maximum Spaceband Before Letterspacing (BellTL12)—numerals 1 and 2 represent a value between 01 and 99 Relative Units, inclusive.
4. Set Average Spaceband (BellTA12)—this value may also fall between 01 and 99 Relative Units, inclusive.

The spaceband Bell codes are used to vary the four limiting values of the spaceband. If no spaceband limit values are stipulated (as via these codes) the standard values will be retained and used by the V-I-P. Upon loading the program or patch tape, standard spaceband values are set as follows:

Minimum Spaceband = 3 Relative Units
Maximum Before Hyphenation = 9 Relative Units
Maximum Before Letterspacing = 9 Relative Units
Average Spaceband = 6 Relative Units

When the above values are varied through the use of a BellT instruction, the altered values remain in effect until changed by another BellT code, or until such time as a new program or patch tape is loaded. The Stop code (BellS) and initialization will NOT reset these values.

Line Measure (BellL1234)—This instruction will cause the line measure to be set at the specified picas and points, where numerals 1 and 2 represent picas and 3 and 4 represent points. Zeroes must be entered where necessary. In the Expanded V-I-P, Models 4836-1X and 4836-MX, the maximum line measure is set at 36 picas; in all other models of the expanded version 45 picas may be entered (in the Display mode of operation the maximum is 99 picas 11 points, for justified copy). The Line Measure instruction must precede the copy which is to be set at the encoded values.

Supplementary Line Length (Bell'1234)—This instruction is placed in front of a line of copy to be set and will cause the encoded length supplement in picas (digits 1 and 2) and points (digits 3 and 4) to be added to the existing line length for the line containing the instruction only.

Example 3

Using the Supplementary Line Length the following car ad may be produced:

INPUT: Ford Fairlane one of the...with six hamsters to go. (QL)
BellM120, Bell'0500$5000. (QR)
Volkswagon...gray and yellow. (QL)
BellM120, Bell'0500$2500. (QR)
BellS

Where: BellM120 is a supplementary film advance of 12 points negative
Bell'0500 is a supplementary line length of 5 picas
(QL) is the Quad Left code
(QR) is the Quad Right code
BellS is the Stop code

OUTPUT: For a 15 pica line at 10 points with a 120 (12 point) film advance setting, the output will read:

CAR ADS

Ford Fairlane one of the worlds most sought after cars is now available for a limited time only in blue and with six hamsters to go.	$5000
Volkswagen is the long lasting car (almost as long as a Ford) that is from Germany, the mother country, and is now available in gray and yellow.	$2500

Film Advance (BellF123)—The Film Advance instruction will set the value for that parameter in points (represented by numerals 1 and 2 in the instruction) and half-points (numeral 3), where a "1" in the latter position indicates one half-point of film advance. Zeroes must be entered where necessary. The Film Advance command must also be encoded prior to encoding copy, and film advance will take place before the copy is set.

Common base alignment during in-line font and point size mixing between two A- and B-range fonts or between two different B-range point sizes may be accomplished through the use of the Film Advance instruction. Because all A-range characters are base aligned while B-range characters are center aligned, the correction factor, or difference between the two "Z" lines (see Figure 5), will be a function of the B-range point size as follows:

$$\text{Change in Z line from B to A} = \frac{\text{B-range Point Size}}{4}$$

The quotient in points represents the film advance necessary for common base alignment between a line of A-range copy and a line of B-range copy. The B-range line will be set first, the film will then be advanced as necessary and the A-range line will be set last.

Required film advance for in-line point size mixing between two B-range fonts may be computed by dividing the difference between the two point sizes by four. Again, the larger copy will be set first, film advance will occur as required and the smaller copy will be set last.

"B" RANGE POINT SIZE	REQUIRED FILM ADVANCE (IN POINTS)	
12	3	
14	3 1/2	
16	4	EXAMPLE SHOWN BELOW
18	4 1/2	
20	5	
22	5 1/2	
24	6	
28	7	
36	9	
48	12	

Figure 5 Alignment of A-range and B-range Characters (except for B. A. machine)

Care must also be exercised when altering the size of copy to be set. In this case, if sufficient film advance has not been allowed for, the subsequent line of copy may be set on top of the previous one. To avoid overlapping copy, an extra Elevate code (or Quad Left in the Unjustified mode) may be entered before changing to a smaller point size, or immediately after changing to a larger one with its associated film advance (maximum film advance is equal to 63 1/2 points in the 36 pica V-I-P and 99 1/2 points in the 45 pica V-I-P).

Immediate Leading (BellIF123)—This instruction causes the film to immediately be advanced the encoded number of points (digits 1 and 2) and half points (digit 3, "1" = half-point of film advance). The code may appear at any point in the input or format.

Ragged Codes

1. Ragged Left (BellRL)
2. Ragged Right (BellRR)
3. Ragged Center (BellRC)
4. Clear Ragged (BellRX)

A ragged setting will result in the normal line justification sequence of events up to and including hyphenation. After an attempt to hyphenate has been made (hyphenation will occur only if permitted) the line will be quadded to the left, right or center, depending on the Ragged code employed. Letterspacing will NOT occur when a ragged condition has been encoded. Spacebands will be set at the average value currently in effect. The ragged line length will always be less than or equal to the specified line length. Issuance of a Ragged command will override any previous ragged condition; therefore, it is unnecessary to encode BellRX when changing between ragged settings. Initialization of the V-I-P will automatically clear the ragged setting.

Supplementary Film Advance (BellM123.) or (BellM123,)—When this machine instruction is terminated by a period, requiring positive leading, supplementary film advance in points (digits 1 and 2) and half points (digit 3) will be added to the line leading for film advance corresponding only to the line containing the instruction. When ending in a comma, indicating negative leading, supplementary film advance will be subtracted from that value. If, when added to the normal film advance, the supplementary film advance results in a negative number, erroneous film advance will result. In the event of multiple supplementary film advance functions in a single line the last function encountered will be carried out. Subsequent supplementary film advances are set to zero by the program. This command may be used to cancel the next line leading, but not to negate it.

Example 4

Using the Automatic Paragraph Indent and Supplementary Film Advance commands, an outline format may be produced.

INPUT:
```
There are...of history. (QL)
1. (QL)
BellI0300BellM120, England is...just over Europe. (QL)
a. (QL)
BellM120, BellI0500London is...in the world. (QL)
BellI0300b. (QL)
BellI0500BellM120, The population...is quite a few. (QL)
BellI00002. (QL)
BellI0300BellM120, France is one...in Europe unlike England. (QL)
a. (QL)
BellM120, BellI0500Paris is the...is the truth. (QL)
BellI0300b. (QL)
BellI0500BellM120, The population of...and Frenchwomen. (QL)
BellS
```

Where:
BellI0300 = Paragraph Indent Bell code of 3 picas
BellI0500 = Paragraph Indent Bell code of 5 picas

BellM120, is a supplementary film advance of 12 points negative (QL) is a Quad Left code
BellS is the Stop code

OUTPUT: For a 15 pica line at 10 points with a 120 (12 point) film advance setting, the output will show:

There are several countries in the world that have made an impact on the development of history.

1. England is one of these countries that reside in the northern half of the world, just over Europe.
   a. London is the capitol of England and this is one of the largest cities in the world.
   b. The population of England is about 65 million people which is quite a few.
2. France is one of these other countries that reside in the northern half of the world. France is located in Europe unlike England.
   a. Paris is the capitol of France and that is the truth.
   b. The population of France I do not know but it is made up of a lot of Frenchmen and Frenchwomen.

Allow Letterspacing (BellK1)—Letterspacing will be allowed in all copy following the BellK1 command, where the maximum value for letterspacing is represented by the numeral in the code. This number may fall between 0 and 9, with each unit representing one Relative Unit of space. If letterspacing occurs, every character will be letterspaced, with the amount always less than or equal to the value encoded in the BellK instruction. Letterspacing may be canceled by the use of BellK0.

Increase Character Width (Bell.12)—Use of this code will result in the addition of width to all subsequent characters. Numerals 1 and 2 in the code represent a 2-digit number from 01-64, where 1 unit is equal in value to $^{2}/_{18}$ point of increase. To cancel an increase, Bell.00 or Bell,00 may be entered.

Decrease Character Width (Bell,12)—This instruction will cause the width of all following characters to be decreased. Numerals 1 and 2 represent a 2-digit number between 01 and 64, with 1 unit being equal in value to $^{2}/_{18}$ point of width decrease. Encoding a Bell,00 or Bell.00 instruction will cancel the width decrease.

Allow Hyphenation (BellE), Cancel Hyphenation (BellG)—Use of a BellE or BellG code preceding the copy to be set will allow (BellE) or not allow (BellG) hyphenation to take place in all subsequent copy.

Discretionary Hyphen (Bell-)—Use of this instruction within a word will cause hyphenation to take place only at the point where the Bell command occurs. A Bell- command may be placed

at any point within a word, and more than one code may be used in any one word. No hyphenation for a word will take place under any circumstances if the instruction precedes that word. In order for Bell- to be valid, hyphenation must be enabled by encoding BellE at the beginning of copy. If hyphenation has been canceled, the Discretionary Hyphen code will be ignored.

Change to Justified Mode (BellJ), Change to Unjustified Mode (BellN)—These codes, when placed in front of the copy, will cause that copy to be set in the Justified (BellJ) or Unjustified (BellN) mode, until a further mode change code is read. Upon initialization the mode is determined by the front panel Mode switch setting.

Flash (Bell8), No Flash (Bell9)—When Bell8 is encoded the V-I-P will flash the character as in normal operation. Bell9, however, will prevent any flash from occurring. Mirror and drum movement will proceed as usual and the machine will remain in the no-flash condition until such time as a Bell8 code is encountered. Flash is enabled upon initialization.

Automatic Hanging Indent (BellH1234)—This instruction is entered in picas (digits 1 and 2) and points (digits 3 and 4) at the start of a new line. If a fixed space is entered prior to an indent, the line on output will be overset. An Automatic Hanging Indent may be cleared by insertion of a BellH0000 or BellS instruction. The Quad Left, Right and Center codes will not clear the indent, but will set it up for the next paragraph. The Elevate code does not affect the hanging indent (see Figure 6).

They came back without the catcher they thought they would have, with a crippled outfield and a little bit farther behind the NL East leaders than they were when they left 10 days ago.

Tonight the Mets begin one of their longest home stands of the year—13 games, with the three California teams making their first visit to Shea. The Padres come in tonight for three, the Giants for three and the Phillies for four. It's a good time for the Mets to make a run at the leaders.

The second paragraph has been hanging indented by 6 picas.

Figure 6 Application of Hanging Indent

Automatic Paragraph Indent (BellI1234)—This instruction is also entered in picas (digits 1 and 2) and points (digits 3 and 4) at the start of a new line. The BellI0000 command clears the Automatic Paragraph Indent, with the Quad Left, Right and Center and Elevate codes behaving as with the Automatic Hanging Indent (see Figure 7).

Automatic Leadering (BellD[Shift]X)—In both the Justified and the Unjustified modes this instruction will cause the character selected (represented by "X" in the code) to be auto-leadered.

A lot of things happened to the Mets on their first tour of the National League's western badlands—all of them bad

Running smack into the blistering hot Giants, the persistent Padres and the desperate Dodgers, the Mets won five of nine, but that's not half the story.

The second paragraph has been indented by 4 picas.

Figure 7 Application of Paragraph Indent

A change to the Shift, Unshift or Supershift condition, if necessary, may be accomplished prior to encoding the character to be leadered. Legal characters for this function include all of the printing characters EXCEPT the em leader[3] and the em space. The en space is used for white space leadering. Only one character may be entered with each BellD code, and the end-of-line code for the line containing the leader must be an Elevate or a Quad code. Quad codes, when entered after auto leadering, will not perform the usual quadding functions, but will behave like an Elevate code and will also signal the end of a paragraph. Character spacing functions (Bell. and Bell,), will not affect spacing of the auto-leadered character during automatic leadering.

Example 5

Using auto leadering it is possible to obtain the following:

INPUT: Ford Fairlane...to go BellD.$5000(QL)
Volkswagon...gray and yellow. BellD.$2500(QL)

Where: BellD. is dot auto leadering.
(QL) is a Quad Left command

OUTPUT: For a 15 pica line at 10 points with a film advance setting of 120, the output will yield:

CAR ADS
Ford Fairlane one of the worlds most sought after cars is now available for a limited time only in blue and with six hamsters to go.....$5000
Volkswagen is the long lasting car (almost as long as a Ford) that is from Germany, the mother country, and is now available in gray and yellow.....$2500

[3]Because one em leader is equivalent to two en leaders (see page 7), leadering with the em leader will be equivalent to leadering with the en leader. Selection of the em leader for auto leadering is therefore not permitted, and if called for will result in cessation of the program.

Tabulation—This command is valid in the Justified and Unjustified modes and may utilize up to twenty (20) unique column widths (see Figure 8). Any text, including auto leadering, which may be set in normal line format may be set in a tab column. The use of indents is not recommended, however, as the same indent would be applied to every column.

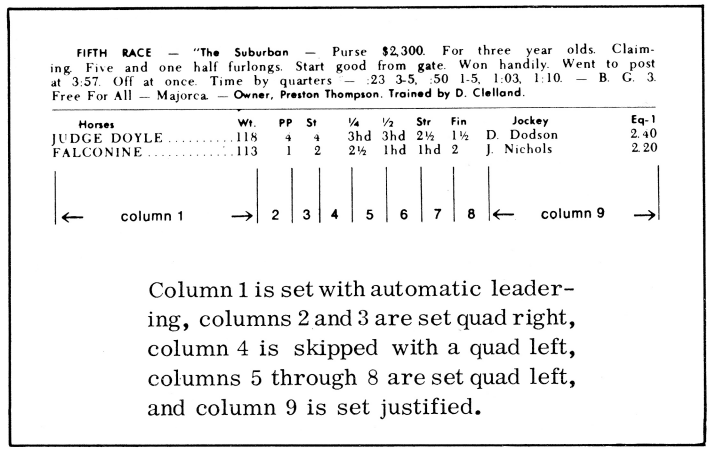


Figure 8 Application of Tabulation

1. Column Widths (BellX1234...1234BellY)—Column widths in picas (digits 1 and 2) and points (digits 3 and 4) are entered between the BellX and BellY codes, where each group of numbers (i.e., 1234) represents one column. Up to twenty separate columns may be entered. A spaceband is left between each 4-digit width specification, signifying the end of each column, but no spaceband can exist between BellX and the first number, or the last number and BellY. Width settings for tab columns may be changed only by encoding new values; BellS will not clear tab column widths.
2. Begin Tabulation (BellU)—This command will cause the V-I-P to commence tabulation. A return to the first column while in the tabulation process may be effected by keying-in the BellU code. After the last column, program return to column 1 is automatic—hence, it is unnecessary to code BellU following the last tab column.
3. Suspend Tabulation (BellZ)—Encoding of the BellZ command will suspend tabulation until a reset (BellU) code is read. Column widths will remain intact until changed by a further BellXBellY instruction.
4. Skip a Column (QL or BellU)—When keying tabular matter, use of the Quad Left instruction[4] will allow one column to be bypassed. Use of the BellU code will result in an immediate return to the start of column 1.
5. Column Termination (QL, QR, QC or Elevate)—A column of tabular matter may be terminated by a Quad Left, Right, Center[4] or an Elevate code.

Stop (BellS)—Upon issuance of a Stop instruction the V-I-P will discontinue both tape reading and outputting. When the front panel RUN button is depressed, point size, font selection, line measure and film advance settings will be reset to the front panel settings. In addition, flash

[4] When operating in the Justified mode, all Quad codes MUST be followed by an Elevate code.

and hyphenation will be enabled, ragged setting and tabulation will be canceled, character spacing (Bell. and Bell,) and all indents will be reset to zero, letterspacing will be reset to 1 Relative Unit and the V-I-P will input tape data from the Reader. Because the Stop instruction is executed in the output routine, all lines will be outputted as long as a Quad Left, Quad Right, Quad Center or Elevate code precedes the Stop. Tabulation column settings are unaffected by the Stop command.

Formatting

Format Coding

Up to forty unique codes may be stored together in a single memory block of the V-I-P and accessed at any point in the program. This feature is known as FORMATTING and is used extensively with the V-I-P. The number of 40-code memory blocks allowable is dependent upon the size of the V-I-P computer memory[5]. Available memory space is divided into blocks, or format areas, each 40 locations in length. The format areas are then numbered sequentially from 1 to N, where "N" represents the final block. If a format consists of greater than 40 codes the excess codes will be added to the next format area, clearing any previously stored codes in that block. While it is legal to store a format containing more than 40 codes, such a procedure necessitates careful accounting of the number of areas utilized by each format. It is therefore recommended that formats be limited to 40 codes, and use of the FORMAT LINKING feature be employed in the event that a format must be extended.

A format may contain any legal V-I-P character and/or function with the exception of BellS (Stop). When BellS is encountered on the format input tape, input will be halted. When inputted, all codes present in the format up to and including BellQE (End Format) will be stored in the 40-code memory block. The storage code BellQS is not stored, however. A format may be entered into memory at the beginning of an input tape, by itself as a distinct tape or following a Quad or an Elevate code anywhere on the input tape. A format will remain in memory until replaced by another format in the same location, an illegal format is called (in this event the memory will be cleared) or, in the 8K V-I-P, the wire service overlay has been added.

Store Format (BellQS12)—This function must directly precede the format data and will cause all of the latter to be stored in the memory block represented by "12" (the BellQS12 code itself is not stored). Storage will continue until the BellQE (End Storage) code is encountered (BellQE must appear as the last code in every format). The digits "12" may represent any two-digit number from 01-99, but must NOT exceed the actual number of format areas available. If a non-existing format is called, the memory will be cleared. Storage of a format will clear a pre-existing format in that location containing the same number of codes.

[5] Single-drum (8K) machines provide storage for 6 forty-code formats. In these machines the format overlay must be loaded prior to using the format feature. Multi-drum (12K) machines contain storage capacity for 80 formats.

Example 6

Encoding the sequence

BellQS02Bell1BellH120BellQE
BellQS01BellP08THIS IS A TESTBellQEBellS

will cause formats to be stored in the memory blocks designated 1 and 2.

Use Format (BellQU12)—Encoding a BellQU12 instruction on the input tape will cause the Reader to halt and the next code to be read from the format indicated by digits 1 and 2 in the BellQU code. The codes in the format will be acted on until a Return code, a BellQE code or another BellQU instruction is encountered (see explanation of the Format Looping, Merge and Format Linking features). When either a Return or a BellQE instruction is encountered the V-I-P will resume data input via the Reader.

End Format (BellQE)—This code when used in the format storage procedure must occur as the final code in the format and denotes the end of that format. The BellQE code itself is stored in the memory block and occupies three code locations.

When encountered in the input text for normal tape input, BellQE will reset the format text pointer to the first code in the format at which the pointer is currently positioned (see discussion of Merge feature).

Use of a format will be terminated when the BellQE code is read at the end of that format. In this instance control will be transferred back to the Reader.

Merge Feature

Merging between the input tape and a format is accomplished through use of the BellQU, Return and BellQE codes. Insertion of a BellQU instruction in the input tape will cause the Reader to stop and the next code to be read from the specified format. Reading of codes in the format will continue until a Return code or a BellQE is encountered. If a Return code has been included in the format, control will immediately be returned to the input tape at the next instruction after the BellQU code. The exit point from the format will be "remembered" and if a Return code is issued on the input tape, the format will be reentered at the point where it was last exited. Any number of Return codes may be encoded on the input tape and in the format.

Example 7

FORMAT 10: Bell1BellP08BellF090(Rt)Bell2BellP09BellF100BellQE

INPUT: BellQU10THIS IS A(QL)(Rt)TEST(QL) BellS

When the input tape is read the output will yield THIS IS A set in 8 points on 9 points of film advance, and TEST set in 9 points on 10 points of film advance.

When a BellQE code is encountered at the end of the format sequence, control will be transferred to the input tape as in the response to a Return instruction. If a Return code has been subsequently encoded on the input tape, control will proceed to the start of that same format. A new format may also be accessed at this time by the input tape via a BellQU command.

In some instances it may be desirable to exit from a format somewhere before the end of the sequence and then return to the beginning of it. This exit and return may be performed in two ways. First, a BellQU instruction calling the same format, issued after control has been transferred to the input tape via a Return command in the format, will effect a transfer to the beginning of the format. Second, issuing BellQE on the input tape after the format has been exited will cause the exit point of the format to be "forgotten"; encoding the Return instruction will then cause the format to be entered at the beginning.

Example 8

FORMAT 1: 1(Rt)2(Rt)3(Rt)4(Rt)BellQE

INPUT: BellQU01and(Rt)andBellQE(Rt)and...

OUTPUT: 1and2and1and...

The symbol (Rt) represents the Return code. After the "2" in format 1 had been accessed the BellQE and (Rt) instructions effected a return to the beginning of format 1.

Format Linking

When a format containing greater than 40 codes (including the BellQE code) is stored in memory, overflow into the next memory block will occur. To reduce the possibility of storage error it is recommended that the Format Linking feature be employed. Since a format may contain any legal character or function other than BellS it is possible to encode the format-calling code BellQU within a format. In this way the first format used will automatically call the second, without a return to the input tape. In addition, the remainder of the format need not be stored in the adjoining memory block, but may occupy any available format area. The BellQU command is placed after the last data code in the format to be extended, directly preceding the BellQE instruction.

Example 9

INPUT: BellQS01 Word1 Word2 BellQU09BellQEBellQS09 Word1 Word2 BellQEBellS

When a tape containing the above coding is read, format area 1 will be stored with the first portion of format 1 and area 9 will contain the remainder. When the processing of codes in block 1 has been completed, control will be automatically transferred to block 9.

Format Looping

By use of the Merge and Format Linking features a format may be designed to loop back to its own beginning. Using such a loop capability, copy may be set with a minimum of coding.

Example 10

FORMAT 1: EMSP EMSP(Rt)(QL)BellQU01BellQEBellS

INPUT: BellQU01(Data)Para1(Data)(Rt)...(Data)ParaN(Data)(QL)BellS

The input tape and format shown will enable several paragraphs to be set with the first line indented 2 em's and the last line quadded left. As can be seen from this example, the coding consists merely of initially calling the format, indicating the end of the paragraph with a Return code and preparing for the next one.

In Example 10 the format itself contains no logical end. There exists an exit point, however, in the Return code which may be used to terminate the format by returning control to the input tape. The format will thus be ended if control is never returned to it. Caution must be observed when using the Format Looping feature, however, as these formats may be set to enter into an infinite loop.

12K Machine Instructions (Bell Coding)

Paragraph Indent (BellIL1234 and BellIR1234)—This instruction is entered in picas (digits 1 and 2) and points (digits 3 and 4) at the start of a new line. When the instruction is coded with the letter L, the specified indent will be from the left margin. Conversely, when the instruction is coded with the letter R, the specified indent will be from the right margin.

Hanging Indent (BellHL1234 and BellHR1234)—This instruction is entered in picas (digits 1 and 2) and points (digits 3 and 4) at the start of a new line. When the instruction is coded with the letter L, the specified indent will be from the paragraph indent, i.e., the sum of the paragraph indent and hanging indent. Conversely, when the instruction is coded with the letter R, the specified indent will be from the right of the last character in the first line of the paragraph.

Indent on Text (BellOL and BellOR)—This instruction is used when the value of the indent depends on the amount of horizontal space used by a given amount of characters and white space. When the instruction is coded with the letter L, and encountered in a line, the number of points set is remembered and applied as a left indent to the following lines. All lines will therefore be indented from the left of the point where the instruction was encountered. Coding the instruction with the letter R will produce the same condition except that the indent will be calculated from the right. Both the left and right indent can be used at the same time. A new indent on text instruction negates the previous indent and causes a new indent to be calculated.

Clear Indent on Text (BellOX)—This instruction will clear all BellOL and/or BellOR instructions previously entered.

Conditional Control Function (BellW1234)—This instruction is entered in lines (digits 1 and 2) and format use code (digits 3 and 4). When encountered, this instruction will cause a link to the format use instruction designated by digits 3 and 4 at the end of the line count specified by digits 1 and 2. In addition, the conditional control function acts as a return code since control is immediately returned to the input tape. If the format use code is the same as the format in which the conditional control function occurs, then the next instruction in the format will be performed. A format use code of 00 will clear the request for a conditional control function. Coding the line count 00 will cause a link to the format specified by the format use code when a quad left, right, or center, or an elevate code is encountered.

12K Machine Conditional Format Looping

Example 11

FORMAT 1: BellQU01EMSPEMSPBellW0801BellIL0200BellW0301 BellIL0000BellW0001BellQU01BellQEBellS

INPUT: BellQU01(Data)Para1(Data)QL. . . (Data)ParaN(Data)QLBellS

OUTPUT: See Figure 9.

This format will give two ems indent at the start of the paragraph, and set a condition such that after 8 lines are set to return to this format. It then will issue a two pica indent on the left and set another condition such that after 3 lines are set to return again. Once control is given back to the format (after 3 lines are set), indents are cancelled and a condition of zero line is issued.

When the line amount is zero, the condition will take affect when a quad left, right, center or elevate code is encountered. This format therefore will be reentered when the end of paragraph is issued which will then cause a loop to restart the format. The BellS instruction stops the looping function.

When stripping of a wire service tape is desired, the mode switch must first be placed at the unjustified. A tape containing the instruction may then be entered, the Mode switch set at the wire service setting and the tape to be stripped may be run. The program will remain in the wire service stripping mode until such time as an unjustified, Justified or Display mode is requested. If, when in the wire service mode and doing wire service stripping, it is desired to remain in wire service but not do stripping, such a transistion may be effected by placing the mode switch at the unjustified setting and, with no tape in the READER, depressing the RUN button. When the RUN light has turned off, the mode switch may be set again at wire service and the tape will be run in the wire service mode but without stripping. The V-I-P program will ignore the end-of-line decisions encoded on the wire service tape, replacing them with the line-ending decisions determined by the logic associated with the unjustified mode of operation. For example, with lines ending in a full word, the Elevate code is replaced by a spaceband code, all three codes will be deleted. End-of-

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Figure 9 Application of 12K Machine Conditional Format Looping

Wire Service

Wire Service Mode

In the Wire Service mode[6], accessed by placing the front panel Mode switch on the wire service setting, all codes are recognized with the exception of the following: Return, Quad Left, Quad Right, Quad Center and Paper Feed. These illegal codes will be ignored by the machine. All other codes will be processed the same as in the Justified mode, with the following exceptions:

1. EN SPACE will produce an en space in Lower Rail and an en leader in Upper Rail.
2. EM SPACE will produce an em space in Lower Rail and an em leader in Upper Rail.
3. EN LEADER will produce an en leader in Lower Rail and an en space in Upper Rail.
4. EM LEADER will produce an em leader in Lower Rail and an em space in Upper Rail.
5. SUPERSHIFT (VERTICAL RULE) will always be treated as an em space.
6. ADD THIN will always be treated as a variable spaceband.

At the end of every line a return to Lower Rail status is automatic in the Wire Service mode; therefore, Upper and Lower Rail codes are redefined as the ability to mix between two adjacent A-range fonts. When two or more Upper or Lower Rail codes in the same line will be read as if only one were present.

A Bell code indicates the start of a visual display. All characters including and after the Bell code will be ignored until the next Elevate code is encountered. All characters on a wire service tape will also be ignored, up to and including the first Elevate code; when processing a wire service tape, therefore, the tape must be placed in the Reader anywhere before the first Elevate code.

[6] In single-drum (8K) machines the wire service overlay must be loaded prior to entering text. Loading the wire service overlay will destroy any formats which may have been previously loaded in the 6 storage areas.

Wire Service Stripping

When stripping of a wire service tape is desired, the Mode switch must first be placed at the unjustified setting. A tape containing the instruction BellVBellS may then be entered, the Mode switch set at the wire service setting and the tape to be stripped may be run. The program will remain in the Wire Service Stripping mode until such time as an Unjustified, Justified or Display mode is requested. If, when in the Wire Service mode and doing wire service stripping, it is desired to remain in Wire Service but not do stripping, such a transistion may be effected by placing the Mode switch at the unjustified setting and, with no tape in the Reader, depressing the RUN button. When the RUN light has turned off, the Mode switch may be set again at wire service and the tape will be run in the Wire Service mode but without stripping.

The V-I-P program will ignore the end-of-line decisions encoded on the wire service tape, replacing them with the line-ending decisions determined by the logic associated with the Unjustified mode of operation. For example, with lines ending in a full word, the Elevate code is replaced by a Spaceband code. In the case of hyphenated line endings where the Hyphen code precedes the Return Elevate code, all three codes will be deleted. End-of-paragraph decisions are made, based on the recognition of either a Thin Space, En Space, Em Space or Supershift (em space) code immediately preceding or following the Elevate code. If a line of copy is both preceded and ended by one or more of the aforementioned spaces, the program will consider it to be a center-quadded line and will treat it accordingly. A Quad Left code will follow the end-of-paragraph decision.

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First column shows setting from wire service tape; second column shows same tape "wire stripped" with line measure changed.

Figure 10 Application of Wire Service Stripping

Table 3 Summary of Machine Instructions for the Expanded V-I-P

Function		Instruction	Where:
Font Change		Bell1 BellX1 BellXBell1	1 = Font positions 1-6, inclusive, for font change on one drum 1 = Font positions 1-6, and X = A, B or C for font changes between drums
Point Size		BellP12	12 = Size in points (see Table 4 for point sizes allowed)
Line Measure		BellL1234	12 = Picas, 34 = Points 0000 to 4500, inclusive 0000 to 9999 Display
Film Advance		BellF123	12 = Points 00 to 99 inclusive, except 36 pica model (63) 3 = Half-points 1 if Half-point, 0 if not
Stop		BellS	
Automatic Hanging Indent		BellH1234	12 = Picas 34 = Points } BellH0000 will cancel
Automatic Paragraph Indent		BellI1234	12 = Picas 34 = Points } BellI0000 will cancel
Automatic Leadering		BellD(Shift)X	(Shift) = Shift, unshift or supershift—used when required to define character X = Character, En leader or En space to be leadered
Tabulation	Set Widths	BellX1234...1234BellY	12 = Picas 34 = Points } May contain up to 20 columns
	Use	BellU	
	Suspend Use	BellZ	
	End Column	QL, QR, QC or Elevate	Returns to column 1 following last column
	Skip a Column	QL	
	Return to Column 1	BellU	
Begin Wire Service Stripping		BellVBellS	
Allow Hyphenation		BellE	
Cancel Hyphenation		BellG	
Change to Justified		BellJ	
Change to Unjustified		BellN	
Increase Character Width		Bell.12	12 = Units of Increase 1 unit = 2/18 point Bell.00 or Bell,00 will cancel
Decrease Character Width		Bell,12	12 = Units of Decrease 1 unit = 2/18 point Bell,00 or Bell.00 will cancel
Allow Letterspacing		BellK1	1 = 0 to 9 Relative Units Max. allowed letterspacing BellK0 will cancel
Supplementary Film Advance		BellM123. or ,	12 = Points, 3 = Half-points . = Positive leading , = Negative leading } Added to next line only
Supplementary Line Length		Bell'1234	12 = Picas 34 = Points } Added to next line only
Discretionary Hyphen		Bell-	If placed in front of word, no hyphenation will occur. Hyphenation must be enabled.
Ragged Codes	Ragged Left	BellRL	
	Ragged Right	BellRR	
	Ragged Center	BellRC	
	Clear Ragged	BellRX	
Spaceband	Set Minimum	BellTN1	1 = 1-9
	Max/Hyph	BellTM12	12 = a two-digit number between 01 and 99, inclusive
	Max/Letter	BellTL12	12 = a two-digit number between 01 and 99, inclusive
	Set Quad	BellTA12	12 = a two-digit number between 01 and 99, inclusive
Format	Store	BellQS12	12 = a two-digit number between 01 and 99, inclusive
	End	BellQE	
	Use	BellQU12	12 = a two-digit number between 01 and 99, inclusive
	Merge	Return	Will transfer control from input tape to format, and vice versa
Flash/ No Flash		Bell8 Bell9	Each code remains in effect until canceled by the other
Immediate Leading		BellIF123	12 = Points, 3 = Half-points Film will advance immediately

NOTE: Instructions are shown in shift position but can be in either shift or unshift position.

Table 4 Characteristics and Variations of Expanded V-I-P Models

Model	Point Size Range	Point Sizes Available	Point Sizes W/Display Attachment	Maximum Number of fonts	Core Capacity	Options Available
7245-3	6-72	22[1]	NA	18	12K	NW
7245-2	6-72	22[1]	NA	12	12K	NW
7245-1	6-72	22[1]	NA	6	8K	NW
7245-3A	6-72	20[2]	NA	18	12K	NW
7245-2A	6-72	20[2]	NA	12	12K	NW
7245-1A	6-72	20[2]	NA	6	12K	NW
4845-3	6-48	17[3]	23[5]	18	12K	DA, NW
4845-2	6-48	17[3]	23[5]	12	12K	DA, NW
4845-1	6-48	17[3]	23[5]	6	8K	DA, NW
4836-1X	6-48[7]	16[4]	22[6]	6	8K	DA, NW
4836-MX	6-48	16[4]	22[6]	6	8K	DA, NW

NOTES:

[1]Point sizes include:
A-range: 6, 7, 8, 9, 10, 11, 12, 14, 18, 20, 24, 27, 30, 36
B-range: 12, 14, 16, 18, 20, 22, 24, 28, 36, 40, 48, 54, 60, 72

[2]Point sizes include:
A-range only: 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 24, 30, 36, 42, 48, 54, 60, 72

[3]Point sizes include:
A-range: 6, 7, 8, 9, 10, 11, 12, 14, 18, 20, 24
B-range: 12, 14, 16, 18, 20, 22, 24, 28, 36, 40, 48

[4]Point sizes include:
A-range: 6, 7, 8, 9, 10, 11, 12, 14, 18, 24
B-range: 12, 14, 16, 18, 20, 22, 24, 28, 36, 48

[5]Display Attachment produces same 17 sizes of basic unit, plus 32, 44, 56, 72, 80, 96.

[6]Display Attachment produces same 16 sizes of 4836-MX, plus 32, 40, 44, 56, 72, 96.

[7]Point sizes are set manually.

OPTION LEGEND:
DA Display Attachment
NW Narrow Width Option
NA Not Available